

**APPARATUS AND METHOD FOR VACUUM ENCAPSULATION
OF SEMICONDUCTOR CHIP PACKAGES**

ABSTRACT

A multi-chamber vacuum encapsulation system for encapsulation of semiconductor chip packages. The encapsulation system includes a dispense chamber, an inlet chamber mounted adjacent an inlet end of the dispense chamber, and an outlet chamber mounted adjacent an outlet end of the dispense chamber. The dispense chamber includes a material dispensing head for dispensing encapsulant material about the peripheral edges of chip packages under at least partial vacuum of the dispense chamber. A transport mechanism is provided in the dispense chamber for moving the chip packages between the inlet and outlet ends of the chamber. During the encapsulation process, the dispense chamber remains evacuated at all times while the smaller inlet and outlet chambers are evacuated and vented in a controlled manner to allow transfer of chip packages to and from the dispense chamber without venting of the dispense chamber to atmosphere. After the dispense cycle in the dispense chamber is completed, the chip packages are transferred to the outlet chamber which is then vented to atmosphere at a controlled rate to complete the encapsulation process. Methods of vacuum encapsulating semiconductor chip packages are also disclosed.

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